Naval Space Command

SPACE TRACKS

A BULLETIN ON NAVAL SPACE ISSUES AND INITIATIVES January/February 1999

Serving Up Space Imagery

System engineer Joshua Colwell *(above)* with Naval Space Command's Remote Earth Sensing Information Center (RESIC) checks an imagery mosaic of the Persian Gulf region created by the center. NAVSPACECOM continues to enhance its efforts toward exploiting and producing imagery for U.S. operational military forces. Initiatives that are broadening the scope of RESIC's support and improving the quality of its products are detailed in our COVER STORY on page 10.

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INSIDE THIS ISSUE

NAVSPACECOM DIRECTORY

Naval Space Command provides direct space support to Fleet and Fleet Marine Force operational units around the world, whether for routine deployments, exercises, or actions in response to a crisis situation. We take very seriously our duty of ensuring that our Sailors and Marines understand what products are available from space, how to access them, and how to exploit those products in the waging of war and peace.

○ Operational Status/Exercise Support Summaries

Naval Space Command maintains a home page on the Global Command and Control System (GCCS) accessible to operational U.S. military forces worldwide at http://navspac1.navspace.navy.smil.mil or http://206.36.197.10.

○ Naval Space Operations Center (540) 653-6500

Call Toll-Free at 1-888-404-6557. Source of space-related operational intelligence. Space reports and analyses are activated on request and are tailored to a deploying unit's operations and geographic area of movement. Tactical assessments of space system capabilities and vulnerabilities to potentially hostile space sensors are also available.

○ Naval Space Support (540) 653-6160

Naval Space Support Teams provide tailored information and training at all operational levels to include on-site training, exercise support, and staff augmentation.

○ Remote Earth Sensing Information Center (540) 653-6520

Naval space Command employs imagery from remote Earth sensing satellites to support intelligence, planning, and operations. Our Remote Earth Sensing Information Center (RESIC) — formerly known as the MSI Cell — processes Landsat, SPOT, and Controlled Image Base (CIB) data in support of Fleet and Fleet Marine Force units. Hardcopy and softcopy products, specifically tailored to users' needs, are produced by RESIC and distributed to support forces participating in real-world crisis, operations, and exercises. RESIC products can be produced to support any of the following applications:

Planning
Target Area Analysis
Bathymetry
Order of Battle Disposition
Change Detection
Broad Area Coverage
Intelligence Prep of the Battlefield
Mission Rehearsal
Amphibious Support
Supplement MC&G Products
Trafficability

Product requests can be submitted via GENADMIN message to: COMNAVSPACECOM DAHLGREN VA//N313//, via facsimile to DSN 249-6167 or (540) 653-6167, via email to MSI@manta.nosc.mil, or via Naval Space Command's SIPRNET web page.

○ Internet On-Line Access

Naval Space Command maintains a home page on the World Wide Web at URL http://www.navspace.navy.mil. Comments or requests for information may be forwarded to the Public Affairs Office via email to gwagner@nsc.navy.mil.

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SPACE TRACKS

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PERSPECTIVE

A Naval Warfighter's View of Space

By Rear Admiral Thomas E. Zelibor

Now that I've been at Naval Space Command for a little over two months, I thought I'd take the opportunity to give you my perspective on space from a warfighter's view. In my previous tours, I — like many of you — was a consumer of space products and never really knew how or why communication, navigation, and imagery were available for operations and planning. I just came to expect that when I needed these products, they would be available. Now that I have become "enlightened," I have a different perspective.

For the U.S. Navy, space is a medium — a means to an end. We exploit its resources to the maximum extent possible to use space as a force enabler, force enhancer, force multiplier, and force sustainer. Space has been integrated into every facet of naval operations and today is indispensible to all aspects of naval warfare.

What exactly has driven the Navy to be so dependent on space? One factor is our operating environment. On any given day, about half of our ships are underway, globally dispersed and encountering a wide range of challenging environmental conditions that impact maritime operations from the littoral to open ocean, from the equator to the poles.

Navy's dependence on space is rooted in our mission. Naval forces conduct the full spectrum of warfare missions — from amphibious to strike to mine — often as the first U.S. military force at the scene of conflict, functioning with limited resources. It's called "come as you are" warfare, and it is a ruthless driver for technology and readiness.

Finally, our Sailors' and Marines' growing dependence on space is a function of what they need to execute their mission successfully: communications, sensor-to-shooter targeting data, imagery, precision location and navigation, and environmental data — both oceanographic and meteorological.

Satellite communications will always be at the top of the requirements list for obvious reasons. We can't run phone lines from the ship's fantail to the pier, and there is no room on board for special communications support groups when forces deploy. In today's warfighting environment, we need and use all communications frequencies and all bandwidths. And because demand for access to satellite communications has increasingly outpaced resources available through DoD space systems, Navy is using more and more commercial assets to fill the void.

Another space resource that has become increasingly important to the naval warfighter over the past few years is Earth imagery. Up-to-date photographic images of the Earth's surface, captured by LANDSAT and SPOT satellites, today are used to highlight specific geographic and environmental features such as shoals and reefs, beach trafficability for amphibious landings, soil composition in potential helo landing zones, freshly dug earthworks or other alterations to the terrain, and lines of communication. The level of detail provided by this imagery has been instrumental in helping us reduce the "fog of war" and improve our amphibious and strike planning.

Our Sailors' and Marines' growing dependence on space is a function of what they need to execute their mission successfully — communications, targeting data, imagery, precision location and navigation, and environmental data

There are clear challenges associated with our growing use of these and a plethora of other space resources. As our dependence on space increases, so does our vulnerability. Survivability of ground-based and space-based components, competition with the private sector for use of commercial space resources, increasing costs, and interoperability are issues that can prevent us from realizing the full potential of space in support of naval operations.

Likewise, the rapid emergence of new space-related technology can hamper our ability to absorb it. To that end, our challenge is to ensure that complexity does not overtake usefulness.

Notwithstanding these and other challenges, present and future naval warfare is inextricably linked to space. Each day brings new and greater opportunities for Sailors and Marines to exploit space in support of their missions. We intend to continue to integrate space technology into every facet of naval operations to enable us to maintain a warfighting edge.

I appreciate the opportunity to address all of you. I look forward to working with you during my tour as Commander of Naval Space Command and to meeting many of you in the next couple years.

13th Commander for Naval Space Command Brings 20 Years of Fleet Experience as Naval Flight Officer, Fighter Squadron and Air Wing Skipper

Rear Admiral Thomas Zelibor Assumes Command of NAVSPACE

Rear Admiral Thomas E. Zelibor assumed command of Naval Space Command on Oct. 1, 1998. He relieved Rear Admiral Patrick Moneymaker, who retired from the Navy on Sept. 10.

Rear Admiral Zelibor, the 13th commander for NAVSPACECOM, served two-and-a-half years with the Operations Directorate (J3) of the Joint Staff as the assistant deputy director for operations (Information Operations) prior to reporting to Dahlgren, Va., to take charge of Naval Space Command.

Originally from Chicago, Ill., Rear Admiral Zelibor graduated from the Naval Academy in 1976 with a bachelor's degree in oceanography and completed Naval Flight Officer training the following year.

After training as an F-14 radar intercept officer at Fighter Squadron VF-124, he served with the "Fighting Aardvarks" of VF-114 in the aircraft carrier USS *America*, and later as an assistant navigator aboard the aircraft carrier USS *John F. Kennedy*. He screened for fighter command while attached to the "Red Rippers" of VF-11 in the aircraft carrier USS *Forrestal*.

Following a tour on CINCLANTFLT staff as deputy director for program planning, he was assigned to the world-famous "Swordsmen" of VF-32 in USS *John F. Kennedy*, and became executive officer in December 1990. He deployed with VF-32 to the Red Sea where he participated in Operation Desert Shield/Storm, flying 30 combat missions in January 1991 against Iraq, and later served as the Swordsmen's commanding officer from February 1992 to September 1993.

Rear Admiral Zelibor next reported to Carrier Air Wing THREE (CVW-3) as deputy air wing commander in the aircraft carrier USS *Dwight D. Eisenhower*. He assumed command of the air wing in March 1995 while on station in the Adriatic Sea during his last sea tour prior to reporting to the Joint Staff.

During his career, Rear Admiral Zelibor has accumulated over 1,000 carrier landings and 3,350 tactical flight hours. His personal awards include the Defense Superior Service Medal, Legion of Merit, Distinguished Service Medal, Distinguished Flying Cross with Combat "V," three Meritorious Service Medals, three Strike/Flight Air Medals (two with Combat "V"), one individual Air Medal with Combat "V," three Navy Commendation Medals (two with Combat "V"), and two Navy Achievement Medals.

Vice Admiral Natter New Director for Space

Vice Admiral Robert J. Natter assumed duties as Director for Space, Information Warfare, Command and Control (N6) on the staff of the Chief of Naval Operations. He relieved Vice Admiral Arthur Cebrowski in August.

Vice Admiral Natter's service at sea has included department head tours in a coastal minesweeper and frigate, and executive officer tours in two amphibious tank landing ships and a Spruance-class destroyer. He was officer in charge of a Naval Special Warfare detachment in Vietnam and commanded USS *Chandler* (DDG 996) and USS *Antietam* (CG 54). Most recently, he commanded the United States Seventh Fleet.

Vice Adm. Natter

The admiral's shore assignments have included tours as executive assistant to the Director of Naval Warfare on CNO staff and as a staff member for the House Armed Services Committee of the 100th Congress.

He also served as executive assistant to the Commander in Chief, U.S. Pacific Fleet, and on another occasion to the Vice Chairman of the Joint Chiefs of Staff during Desert Storm operations in the Middle East. In addition, he held assignments as the Assistant Chief of Naval Personnel for officer and enlisted personnel assignments, and as chief of the Navy's legislative affairs organization.

A native of Trussville, Ala., he completed one year of reserve enlisted service prior to receiving an appointment to the Naval Academy. He graduated and received his officer's commission in 1967. He is also a graduate of the Naval War College and holds master's degrees in business management and international relations.

Navy Poised to Ensure Successful GEOSAT Follow-On Satellite Operations

By Michael J. Crawford

The Geodetic/Geophysical Satellite Follow-On (GFO) altimetry satellite was launched on a Taurus rocket from Vandenburg Air Force Base on Feb. 10, 1998. Since that time, the GFO Operations Team has moved the satellite into the GEOSAT Exact Repeat Orbit, checked out much of the spacecraft and smoothed out and standardized many of the operations procedures.

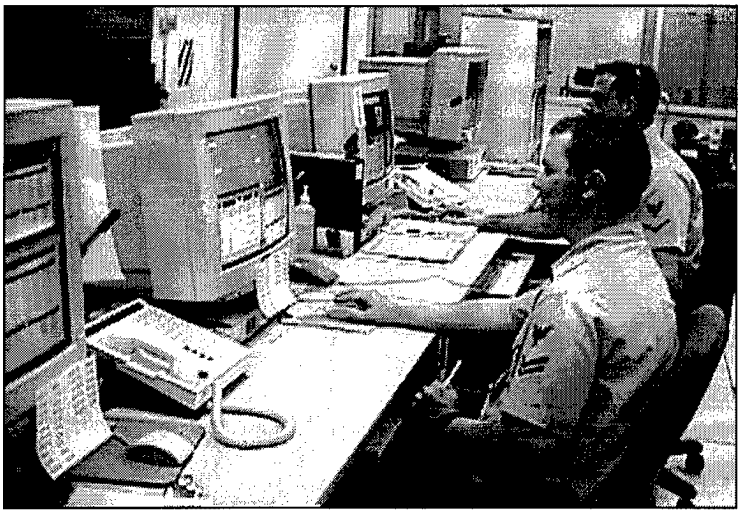
Since the GFO launch, the Naval Satellite Operations Center (NAVSOC) has conducted GFO spacecraft operations from the command's headquarters at Point Mugu, Calif., via remote tracking sites at NAVSOC's Detachment ALFA in Prospect Harbor, Maine, and Laguna Peak at Point Mugu. These GFO operations have been highly successful due to the efforts of many dedicated people.

On the first opportunity after launch, the NAVSOC Laguna Peak remote site was able to receive a small, but critical sample of telemetry. This sample indicated that the stored command to enable the satellite hazard bus had executed properly. This knowledge allowed the GFO operations team to breathe easier during the three hours before the first pass at the NAVSOC Detachment ALFA remote site during revolution (rev) 3. It was difficult to collect this telemetry with the very-narrow-beam Laguna Peak antenna because the prelaunch nominal orbit elements were so far from the actual satellite position (more than two minutes) that the GFO Doppler Tracking System (GDTS) did not receive any Doppler signals at NAVSOC headquarters during that pass.

NAVSOC had developed the GDTS with in-house resources and it has been an overwhelming success. Although GDTS did not track that first pass, it did collect data on the first two passes at Detachment ALFA. Receiving this data assured GFO engineers that the satellite was okay, even though they did not receive Space Ground Link System signals until they commanded the transmitter on midway through the rev 4 pass.

Using GDTS data, the Doppler Orbit Computer (DOC) rapidly determined an accurate orbit after launch and after each thruster burn, allowing smooth operations to continue. Raytheon STX provided the majority of the DOC software under a contract with Naval Space Command.

NAVSOC developed an in-house training program for the primary members of the GFO operations team — the satellite engineers. Prior to launch, the engineers not only had to learn operations, but also had to develop and test much of the system. The engineers' intense prelaunch procedure development, training sessions, exercises and rehearsals have paid dividends.



NAVSOC Sailors monitor space systems from the command's state-of-the-art Satellite Operations Center at Point Mugu, Calif.

Ball Aerospace and Technologies Corporation (Ball) has provided a team of engineers both at NAVSOC and at their facility in Boulder, Colo. This team retains the GFO satellite control authority and has worked diligently to resolve satellite problems as they arise. Their mission operations managers contributed significantly to the development of a smoothly functioning operations team.

NAVSOC Maintenance Department technicians and Detachment ALFA operators provided valuable pre-launch and real-time post-launch support. Without their support, the GFO operations success rate would have been lower.

Operators at NAVSOC's Detachment CHARLIE in Guam kept their GDTS operating properly and reported valuable information to the headquarters operations team.

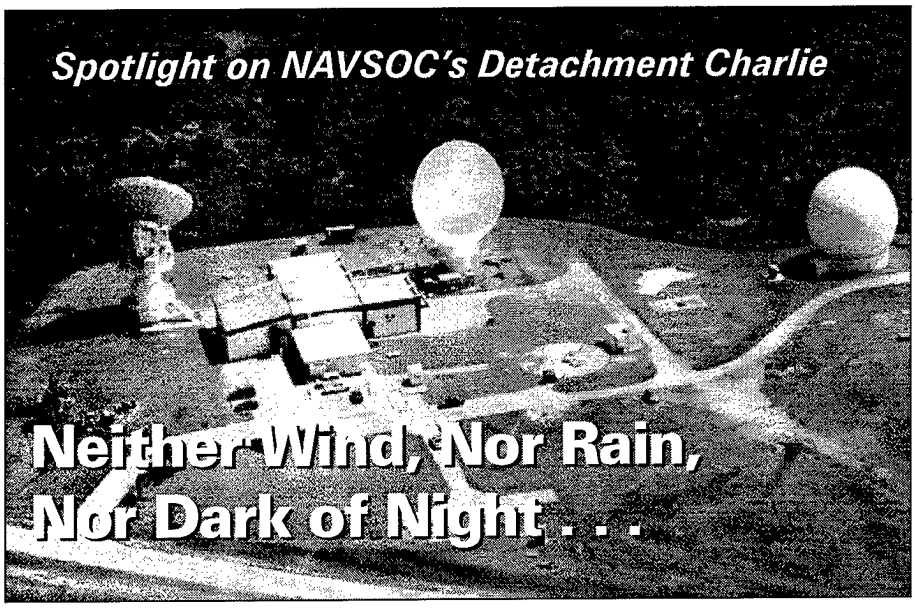
Other key participants have been software engineers, who provided extremely important behind-the-scenes software development support.

In April, NAVSOC transferred GFO operations from the dedicated GFO Satellite Operations Center (SOC) to the SOC where they conduct all satellite operations. This move was the first step to normalize GFO operations.

In the near future, NAVSOC duty satellite managers (DSMs) will assume control of routine GFO operations from the satellite engineers. At that time, the NAVSOC satellite engineers and DSMs will assure that mission data flows to the payload operations center at the Naval Oceanographic Office in Stennis Space Center, Miss.

Additional information about GFO is available from the following Space and Naval Warfare Systems Command (SPAWAR) on-line sites. The SPAWAR Public Affairs Office GFO fact sheet is located at http://www.spawar.navy.mil/corporate/spawarpao/newsreleases/gfo_fact_sheet.html. The ISR Spectrum magazine at http://www.trwiuss.com/spectrum/ contains an article about the GFO mission design. The GFO Web site at http://gfo.bmpcoe.org/gfo/ contains current information about the GFO mission.

Michael J. Crawford is the GFO project engineer for the Naval Satellite Operations Center.



By ETC(AW/SW) Sherry R. Rose

On a tiny speck of an island over a thousand miles from any appreciable land mass, a small group of people spend their days (and nights) watching satellites. Naval Satellite Operations Center's (NAVSOC) Detachment Charlie is a minuscule tenant command located at the Naval Computer and Telecommunications Station on Guam, an eight-by-thirty-mile island in the West Pacific.

Detachment Charlie is one of three NAVSOC detachments. Its mission includes providing 24-hour EHF and SHF telemetry, tracking, and commanding operations for UHF Follow-On (UFO) satellites in coordination with Satellite Operations Center Squadron 31 at Schriever Air Force Base, Colo. The detachment also monitors on-orbit SHF telemetry for FLTSAT and UFO satellites for the purpose of vehicle health and welfare, accomplished via the Space Ground Link System (SGLS), in coordination with NAVSOC headquarters.

Additionally, the Guam detachment provides payload monitoring capabilities to resolve any possible anomalies for frequency channels associated with FLTSAT and UFO satellites, and performs Doppler collection for the GEOSAT Follow-on (GFO) satellite.

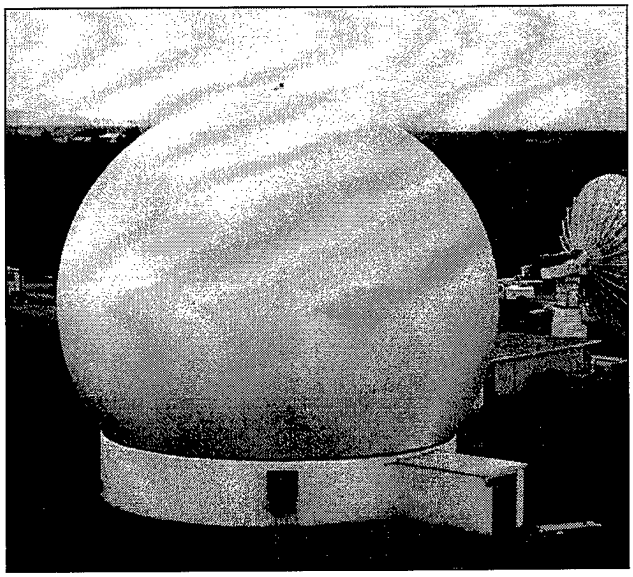
Personnel at Detachment Charlie include an officer in charge, two chief petty officers, and four watchstanders, as well as a civilian GTE contractor who is responsible for much of the maintenance in the detachment. With the assistance of Detachment Charlie maintenance personnel, GTE helps to ensure that all systems are fully functional at all times. The OIC and CPOs often assist as both watchstanders and maintenance workers. The ability of detachment personnel to cover any contingency is what allows it to continue to function successfully.

Detachment Charlie's abilities were tested when super typhoon Paka hit Guam on Dec. 16, 1997. Battering the island for more than 10 hours, the super typhoon carried sustained winds of over 170 mph, with gusts to 236 mph, the highest ever recorded, and caused island-wide devastation including the destruction of most power lines and many buildings. Yet, NAVSOC's Detachment Charlie was back on line and fully operational within 24 hours and was the first operational unit on the island to resume its full mission after the "all clear" was sounded.

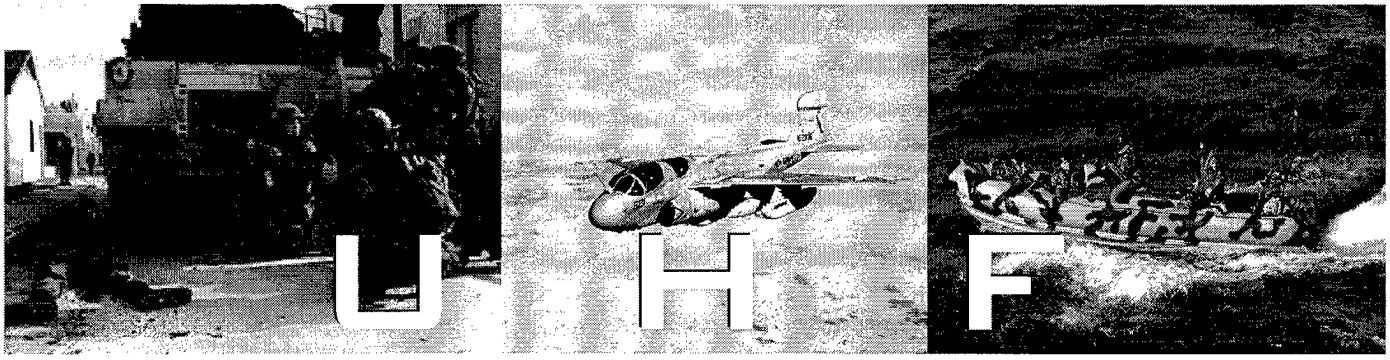
Prior to the typhoon, it was not a certainty that the detachment would be able to weather one of the intense typhoons that occur with some frequency in Guam. Housing the10-meter antenna is a semi-experimental pressurized Kevlar dome, a balloon-like structure that was rated by its manufacturer as being able to withstand up to 155 mph winds. However, the structure had never actually been through a typhoon before. Were the dome to collapse under the pressure of the winds, it would have most likely caused severe damage to the antenna it was designed to protect.

After the typhoon, with uprooted trees, flattened homes, and downed power lines littering the landscape, the detachment was amazed and relieved to find that the integrity of the dome was not breached at any point. No damage to the structure or blower system was found, even with wind gusts of 200+ mph.

The anemometer, which supplies the wind speed information to the high-speed blower system, sustained no damage during the storm either. The ability of the detachment to remain operational during the height of the storm was a key factor in the survival of the dome structure. Detachment Charlie's efforts to upgrade and harden the system, linked with a conscientious preventive maintenance program, have resulted in positive results in the extreme conditions in which the system must operate.



The pressurized dome housing Detachment Charlie's 10-meter SGLS antenna successfully withstood a super typhoon that crippled Guam in 1997.



The Spectrum of Choice for Mobile Warfighters

By Al Sapp

The U.S. Government continues to study ways to reduce the budget by selling or leasing government assets to private industry. Available assets include federal land, buildings, and even parts of the frequency spectrum reserved for use by the military. The ultra-high-frequency (UHF) spectrum, invaluable to the warfighter for satellite communications, may someday appear on the auction block. Loss of the UHF spectrum to private industry would severely hamper the warfighter's means to fight and win the next battle.

Today, U.S. military forces demonstrate a strong and consistent demand for every portion of their allotted share of the frequency spectrum used for satellite communications. On a typical deployment, an Army division, Marine Expeditionary Force (MEF), Air Force air wing, or Navy battlegroup ventures into harm's way equipped with a bevy of satellite communications equipment spanning the allotted spectrum.

Each segment of the spectrum brings a unique capability to the warfighter. For example, when a stealthy attack submarine needs to communicate without being detected, it uses the protected communications of the extremely-high-frequency (EHF) spectrum. When a Navy aircraft carrier needs to receive a massive Air Traffic Order (ATO), it turns to the high throughput of the super-high-frequency (SHF) spectrum. When an infantryman needs to communicate the distance no matter the weather, his geographical location, or the overhead foliage, he'll most likely push-to-talk on a UHF satellite communications terminal.

The UHF spectrum has characteristics that make it invaluable not only to the infantryman but to many other types of warfighters. The UHF spectrum permits the Sailor, Marine, airman, or soldier to easily communicate on a secure combat radio net from nearly any place on Earth using a relatively inexpensive and lightweight terminal under harsh environmental conditions with direct connectivity to many other warfighters.

Some other satellite or terrestrial communications systems may satisfy some of these battlefield requirements. Yet no other system, military or commercial, from any other frequency spectrum can match the UHF spectrum in what it provides to the warfighter.

UHF works in harsh operational environments. The UHF communications signal is able to penetrate a double canopy jungle or heavy rain to reach the satellite and, in turn, complete the link to the other user. Radios using other parts of the frequency spectrum, particularly the EHF spectrum, have problems with either thick foliage or heavy rain. With a UHF terminal, a warfighter may fight and communicate in all types of weather while using the foliage for concealment.

Worldwide Coverage

The UHF terminal is relatively lightweight and inexpensive. The manpack configuration makes them highly mobile. Manpack UHF satellite communications terminals, such as the AN/PSC-5 Spitfire, are widely distributed across all services to include such habitually deployed units as the U.S. Army's 82nd Infantry Division (Airborne). Many other type satellite terminals such as the SHF Terminal and Range Extension Terminal (STAR-T) are deployed on a HMMWV.

Another advantage in using a UHF satellite communications terminal is its simplicity. Antennas are easy to set up and point to the appropriate satellite. Operator controls are not much more complex than most combat net radios. Training costs and duration is minimal for UHF terminals.

The UHF spectrum, sold at a government garage sale, may bring in much needed cash, but the loss of the UHF spectrum may cost the warfighter lives in the next battle.

UHF satellite coverage is worldwide and provides daily service to deployed forces in such hot spots as Korea, Southwest Asia, and Bosnia. Worldwide coverage is an important feature of UHF as well as other military satellite communication systems.

U.S. military units, such as naval forces at sea, frequently deploy to areas where there is no ground communications infrastructure. Even ground troops sometimes find themselves in an area where there is little initial organic communications support, and the host nation is unable or slow to help. Yet, these forces

*(Please see **UHF** on page 8)*

UHF Increased Demand By All Services Forecasted for Operational Military UHF Communications

(Continued from page 7)

are nearly always within reach of a UHF satellite. Every battle fought by the United States in the last 20 years has been within the footprint of a UHF satellite. The UHF Follow-On (UFO) satellite constellation in orbit now is ready to support the warfighter during the next battle.

U.S. armed forces clearly recognize the distinct advantages of using UHF and have invested heavily in UHF terminals and operator training. UHF satellite communications terminals are found in vehicular, ship, aircraft, and manpack configurations. This tremendous investment by the military in the UHF spectrum will steadily climb in the upcoming years as all services, particularly the Army, continue to field the AN/PSC-5 Spitfire terminal. The loss of the UHF spectrum to private industry would result in thousands of military radios, some yet to be fielded, made useless.

Operational Limitations

The Department of Defense will have also invested over a billion dollars in the present UHF satellite constellation once all UFO satellites are launched. The Navy is studying ways to transition from the present UHF satellite constellation to an objective system in 2007. A decision on what exactly will comprise the objective system is a long way off. All material solutions, to include commercial systems, are being considered. However, the Navy has included in its strategy to posture the objective system for backward compatibility to those UHF terminals that will be in service in 2007 and beyond.

Despite this huge investment in UHF, some companies may offer what is viewed as a good business case for the military to drop the UHF terminals and spectrum in favor of their respective commercial system. Emerging commercial satellite systems seem attractive with their impressive advances in terminal technology. These new, highly capable terminals are handheld, user friendly, relatively inexpensive, and supported by a vast satellite network.

Yet, the commercial systems operate in frequencies higher than the military UHF spectrum and, thus, have some operational limitations. With a commercial terminal, the user may be required to reveal his or her location by venturing close to a window or away from concealing foliage to establish a link to the commercial satellite system. This is unacceptable to a warfighter operating in close proximity to the enemy.

So, while commercial systems may satisfy some military users, others will require UHF to operate under realistic combat conditions. The UHF spectrum remains the spectrum of choice for mobile warfighters.

The real challenge is to make the UHF system more accessible to the users who need it. Today, the demand for UHF services exceeds the number of users who can access the network. Some estimates show the UHF spectrum oversubscribed by 250 percent. Analysis conducted by Naval Space Command as part of the Mobile User Study (MUS) shows that the demand for UHF is expected to increase.

More efficient ways to use the spectrum are badly needed. One such promise for greater spectrum efficiency is the use of Demand Assigned Multiple Access (DAMA) techniques and equipment. The Department of Defense is committed to DAMA and is making steady progress towards its implementation.

Financially Committed

All the services are committed financially and, more importantly, operationally to the UHF spectrum. The UHF spectrum offers a blend of capabilities that is needed by the mobile warfighter and not found with any other military or commercial satellite system. The U.S. military is keenly aware of the necessity of the UHF spectrum and is making progress to make the spectrum more efficient as demand for UHF service increases.

At the same time, the federal government is under pressure to find ways to reduce the budget deficit. The UHF spectrum, sold at a government garage sale, may bring in much needed cash, but the loss of the UHF spectrum may cost the warfighter lives in the next battle.

Al Sapp is employed by ARINC and supports Naval Space Command's SATCOM Plans & Policy Branch.

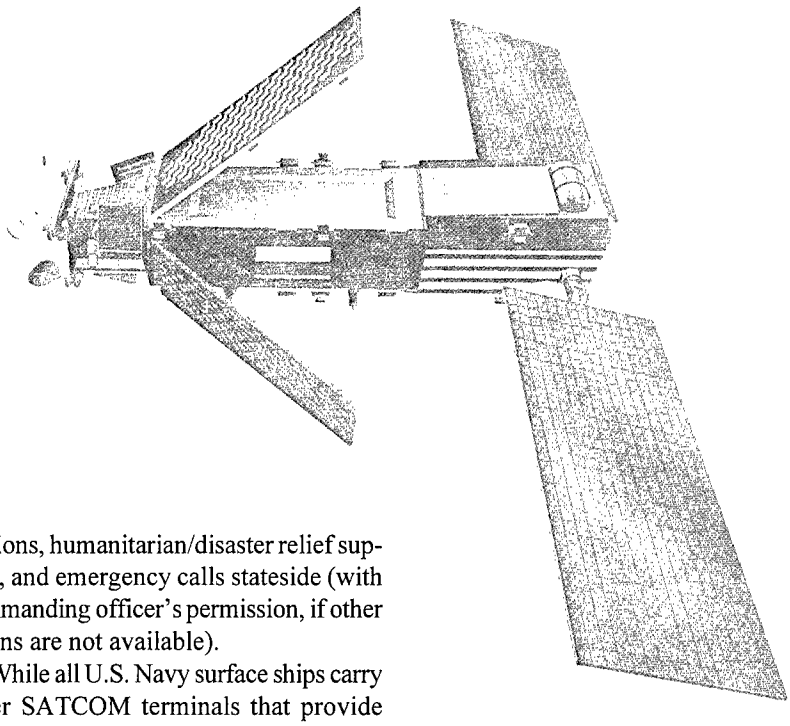
Iridium...Whether By Land Or By Sea?

New Satellite System Offers Cost-Effective Telephone, Low-Data-Rate Service

By Thomas B. Sanford

Iridium ... the 77th element, largely unknown by the common man. That is, until the Motorola Corporation enshrined Iridium as the leading initiative for highly advanced mobile satellite communications.

On Nov. 1, 1998, when the Iridium satellite communications (SATCOM) system became operational, the task of communicating anywhere in the world began to get easier. This low Earth orbit (LEO) constellation of 66 operational satellites is designed to provide worldwide telephone and low-data-rate service to registered, cellular-phone-sized handsets.



A handset will function first as a cell phone, if the user is in range of a land-based cellular site. If the call cannot be completed in this mode, the handset will access an Iridium satellite passing overhead (at an altitude of 422 miles), which activates the crosslinking feature of the system. Iridium is the first LEO SATCOM system to make use of crosslinks, which are high-bandwidth inter-satellite links that pass a signal from satellite to satellite until the approximate location of the intended recipient is reached. This allows a user to place a telephone call to any point on the Earth's surface (including the polar regions), with minimal reliance on the ground-based public switched telephone network.

The signal is then sent to an Earth station (gateway) for transfer to the recipient, while an identification chip in the caller's handset identifies the user's home gateway for proper billing.

A gateway in Hawaii will consolidate billing information for all Department of Defense users, and will provide access into the Defense Information Switched Network (DISN). Possible government uses include commander in chief (CINC) communications, search and rescue operations, humanitarian/disaster relief support, and emergency calls stateside (with commanding officer's permission, if other means are not available).

While all U.S. Navy surface ships carry other SATCOM terminals that provide greater capability, there may be shipboard use for the Iridium handsets as a back-up global communications system, and to provide netted communications with other ships. Additionally, Iridium may be used by the ship to talk with shore detachments etc., especially in and near ports with limited domestic connectivity.

Navy land-based units that routinely deploy personnel to remote locations are also likely to be able to make full use of this system, as they will be out of the reach of more inexpensive, terrestrial communications systems.

The cost structure for this system is still being developed. However, it appears likely that there will be three components: air time, land charges, and a monthly service fee. This may become rather expensive, which could limit the use of these handsets to occasions when there aren't any other communications options. The system could be especially useful to smaller commands or units that have limited communications assets, and to those that deploy detachments throughout the country or around the world.

Although the costs of using this system have not been fully defined, it is safe to assume that the Iridium system will be a valuable addition to existing communications systems for military users and others. Despite worldwide skepticism, the Iridium team has successfully lifted over 70 spacecraft to LEO, increasing the world's stable of communications satellites by 50 percent. Now, whether on land or at sea, a user can communicate anywhere on the globe from a handheld phone at the touch of a button.

Thomas Sanford is a commercial SATCOM action officer in NAVSPACECOM's Plans Division.

'Digital Seabag' Provides Customized Space Imagery to Deploying Units to Enhance Situational Awareness and Assist in Mission Planning

'Virtual Reality' for the Modern Warfighter

By Lt. Bryan Jung

Today's warfighter needs the best possible information in order to gain the edge in conflict. Space has become a powerful resource that is being used to bring mapping, charting, and geodesy alive to deployed Navy and Fleet Marine Forces (FMF) worldwide.

Naval Space Command (NAVSPACECOM) has been providing remote-sensed multi-spectral imagery (MSI) products via its Remote Earth Sensing Information Center (RESIC) to Navy and Fleet Marine Forces for over 13 years.

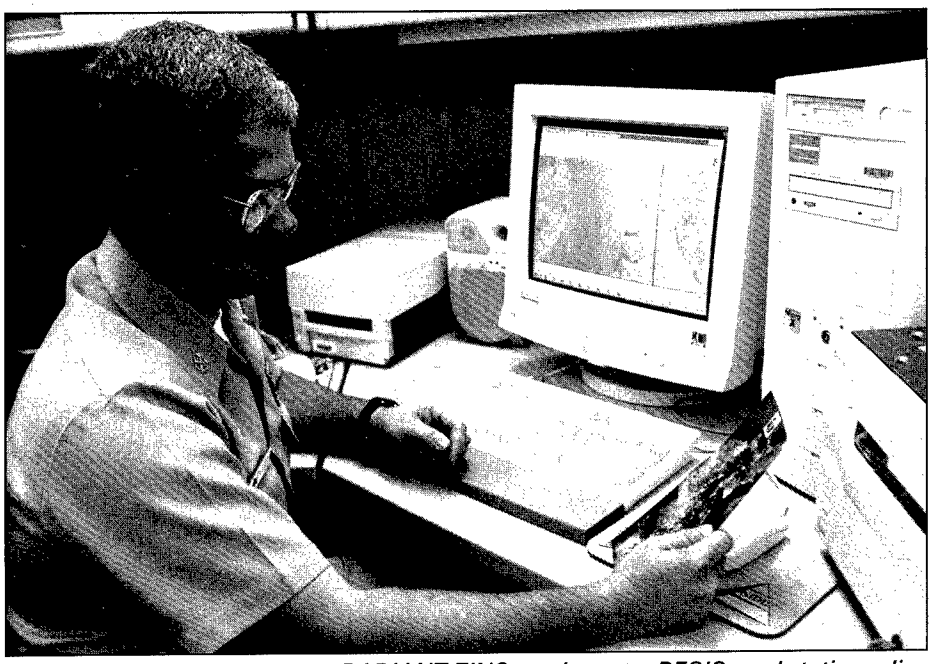
MSI simply refers to digital data obtained by a sensor over two or more spectral bands. The sensor measures the reflected and emitted energy from objects on Earth and then transmits collected data to various ground stations positioned worldwide.

RESIC utilizes MSI data collected from space-borne sensors and sensors on board aircraft. Most of the MSI data utilized by the center is collected by U.S. Landsat and the French SPOT commercial satellite sensors.

The RESIC, formerly known as the MSI Cell, has been an industry leader in MSI exploitation and production, providing over 16,000 tailor-made products to Navy and FMF units, as well as various other DoD agencies. NAVSPACECOM's space-resourced imagery has supported Operations Desert Storm, Desert Thunder, United Shield, as well as U.S. forces in Bosnia-Hercegovinia.

RESIC products have also been used for non-combatant evacuation operations in Rwanda-Burundi, Monrovia, Haiti, and Liberia, and most recently by the USS Essex amphibious ready group for NEO planning in Ethiopia and Eritrea.

Additionally, the RESIC routinely builds custom MSI products in direct support of numerous Joint Chief of Staff (JCS) and fleet exercises, including Ulchi Focus Lens, Global Guardian, and RIMPAC.



OSC Litten (above) inspects a RADIANT ZINC product at a RESIC workstation. Jim Moeller loads imagery data into the center's robotic data retrieval device (top right), while OS2 Woods removes a large-format chart from the printer (bottom right).

Partnered With NIMA

In order to meet the ever-changing requirements of deployed forces, RESIC has adapted its products to provide today's warfighter with the best possible information for broad-area coverage, situational awareness, and specific mission planning.

Recently, Naval Space Command entered into a partnership with the National Imagery and Mapping Agency (NIMA) and the Commercial Imagery Satellite Library (CSIL) to broaden the scope of RESIC support and improve the quality of products offered. RESIC is producing LANDSAT merges with NIMA's Controlled Image Base (CIB) five-meter imagery to produce custom products that can be utilized for specific mission planning.

RESIC has also incorporated NIMA-produced ARC digitized raster graphics (ADRG) into its products. This capability allows Naval Space Command to overlay digitized maps onto imagery data sets/scenes. These new products recently made their debut during exercises RIMPAC 98 and Ulchi Focus Lens 98.

Further enhancements to the imagery provided through RESIC are being actively pursued. One NAVSPACECOM initiative involves working with NIMA to co-produce compressed aeronautical chart (CAC) and compressed ARC digitized raster graphics (CADRG). This will enable RESIC to utilize NIMA-resourced ADRG to produce digitized products for not only the Navy and Marine Corps, but the Air Force and Army as well.

RESIC currently has the organic capability to exploit hyper-spectral imagery (HSI) data sets, and the center is poised to work with data provided by the Naval Research Laboratory's Naval Earth Map Observer (NEMO) satellite when launched, and to exploit one-meter commercial imagery when it becomes available.

One of the latest initiatives by Naval Space Command's RESIC is the "Digital Seabag." The digital seabag is a series of CD-ROMs that contain exploited imagery for a specific purpose (i.e. exercise or operation), or imagery specific to a particular country or Area or Responsibility

(AOR). The most attractive feature of the digital seabag is that it can be pulled off the shelf and go out the door with deployers in a matter of minutes. The digital sea bag concept made its debut during exercise Ulchi Focus Lens 98. The concept of providing the warfighter with custom imagery prior to deployment was featured in COMPHIBRON FIVE/ ESSEX ARG during their actual WESTPAC/IO deployment.

Wide-Ranging Expertise

Eight military personnel and civilian contractors comprise the RESIC staff. Active-duty Navy members of the team include Lt. Bryan Jung as RESIC program manager and Chief Operations Specialist David Litten as principal assistant. Providing production and maintenance support are 2nd Class Petty Officers Jesse Woods and Rockell Powell — both operations specialists — and 2nd Class Petty Officer Jennifer Reinhart, a cryptologic technician. Combined, they have over 60 years of experience in naval operations.

Civilian members of the RESIC team include Joshua Colwell as principal system engineer along with Jim Moeller and James Clingensmith. Together, they bring to the RESIC over 28 years of expertise in imagery exploitation and analysis.

The RESIC staff is augmented by Naval Reservists from Naval Reserve NAVSPACECOM 0166 and 0266 to boost production capabilities when fleet demand dictates.

Extensive Imagery Archive

Naval Space Command's RESIC is equipped with the latest imagery exploitation hardware and software available in the industry. The center currently utilizes both Silicon Graphics and Hewlett Packard HP processors to exploit imagery data sets with commercial off-the-shelf software, including EDGE, ERDAS Imagine, ER Mapper, ENVI, IDL, and ARC/INFO.

RESIC has an extensive in-house imagery archive library that currently holds nearly 3,000 Landsat/SPOT scenes and more than 6,500 controlled image base (CIB) images. The center's archive of ARC digitized raster graphics (ADRG) contains over 7,000 data sets.

In order to maintain its on-line imagery archives, RESIC employs over 45 different hard drives for a total of 260 gigabytes of on-line storage, with an additional two teribyte data archive capability. The RESIC staff can produce up to 75 CD-ROMs using the center's own CD recording studio.

RESIC products are available as large-format prints (30"x47") or small-format prints (8.5"x11") in both paper and transparency media, at photo or near photo quality. Imagery is also produced in "soft-copy" as 4-mm and 8-mm tapes, CD-ROMs, and VHS tapes. Electronic versions of RESIC imagery products are offered in IMG, LAN, ERS, BIL, BSQ, BUP, TIF, GEOTIF, BMP, and GIF formats to ensure they will be compatible with a customer's needs and available resources.

During the 1998 fiscal year, RESIC produced almost 5,000 custom products. The center's customized imagery products are used in a wide range of applications, to include:

- Mission Planning
- Intelligence Prep of the Battlefield
- Mission Rehearsal
- MC&G Supplement
- Order of Battle Disposition
- Change Detection
- Broad Area Coverage
- Situational Awareness
- Bathymetry
- Amphibious Operations
- Target Area Analysis
- Trafficability Studies

Electronic Connectivity

Naval Space Command is committed to the timely dissemination of customized imagery to the Fleet and FMF. Hardcopy products are delivered routinely through regular postal service or via express mail as required. In addition, RESIC's imagery data sets can be uploaded electronically onto the Global Broadcast System (GBS), Joint Broadcast System (JBS), SIPRNET, JDISS, or JWICS.

A web page for RESIC can be accessed from Naval Space Command's home page on the SIPRNET. Currently, samples of RESIC's imagery products can be viewed and ordered directly from the web page. In the near future, the center will be connected directly to the SIPRNET. That connection will enable NAVSPACECOM to upload data sets to the network for customers to access and download at their leisure.

*(Please see **RESIC** on page 12)*

RESIC

(Continued from page 11)

Imagery dissemination via "ZINC" is available to authorized clients. The ZINC software package allows users to pull compressed imagery via regular phone line directly to a PC/Laptop computer for limited exploitation. ZINC software is available on CD-ROM upon request.

In order to provide our clients with the best and fastest service, the RESIC is scheduled to receive the Commercial Imagery Dissemination (CID) system. CID will enable RESIC to receive NIMA or CSIL data directly from their archives via satellite. This capability, combined with instant access to the SIPRNET, will greatly facilitate the center's ability to deliver products to users in a timely manner.

For More Information

Naval Space Command's RESIC is located at the Naval Surface Warfare Center in Dahlgren, Va., and can be accessed as follows:

INTERNET: msi@manta.nosc.mil
SIPRNET:
http://navspac1.navspace.navy.smil.mil
GENSER Message:
COMNAVSPACECOM DAHLGREN VA//N313//
Telephone: (540) 653-6520
FAX: (540) 653-6167, DSN: 249-6520

RESIC has recently completed an orientation CD-ROM that presents an overview on the center's mission and capabilities — formatted in both PowerPoint and HTML — and contains all documentation required to order imagery. This product is available to any Navy or FMF unit, DoD agency, or other service component on request. The CD-ROM also contains over 2,000 thumbnail images for viewing. Special CDs have been produced to contain ZINC client software as well.

Lt. Bryan Jung is a Limited Duty Officer with over 21 years of operational military experience. He is currently assigned to Naval Space Command as the RESIC program manager.

NEWS BRIEFS

Space Surveillance Contract Awarded

A new contract to operate and maintain Naval Space Command's network of space surveillance field stations has been awarded to Chugach Telecommunications and Computers, Inc. (CTCI) of Anchorage, Alaska.

The first year of this five-year contract is priced at $6.4 million. Service began on Oct. 1, 1998. Total value for the duration of the contract is approximately $31 million.

Over 100 employees work at nine field stations in eight states to operate the space surveillance network around the clock. In operation since 1961, the network is the nation's only unalerted sensor dedicated to tracking space objects.

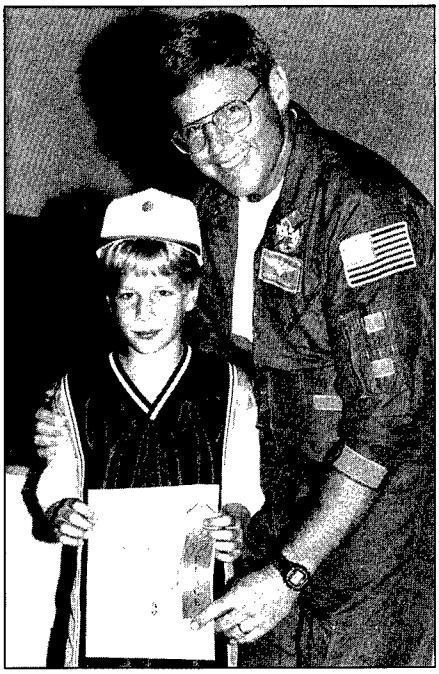
Linked to the data processing center in Naval Space Command's headquarters at Dahlgren, Va., the surveillance network is able to maintain independently a space object data base for nearly 70 percent of all objects in space. Each day, the network captures data on the 22,000 crossings of space objects in orbit over the United States.

CTCI is a subsidiary of the Chugach Alaska Corporation established in 1971 under the Alaska Native Settlement Claims Act. The company, which is certified in the Small Business Administration's business development plan, provides program management and information services to government and private companies.

In addition to its Anchorage headquarters, Chugach maintains offices in Hawaii, Washington, Tennessee, Virginia, and the District of Columbia.

CTCI received this multi-year contract to continue to operate the space sensor network, in part due to their successful performance in fiscal year 1998.

On hand for the space surveillance contract signing were (seated left to right) Michael F. G. Williams, president and CEO for CTCI, and Paul Learn, contracting officer for the Naval Surface Warfare Center Dahlgren Division (NSWCDD). Also participating were (standing left to right) Cmdr. Tony Martinez, supply officer for NSWCDD; Harry Witherite, program manager for CTCI; Janice Williams, contract specialist for NSWCDD; Carroll Hayden, NAVSPACECOM's surveillance program manager and contracting officer's representative; and Capt. Sheila McCoy, director of NAVSPACECOM's Information Systems Division.

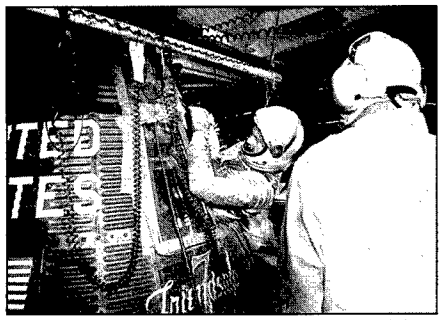


Space Artists Meet Astronaut

NASA astronaut and Navy Capt. Steve Oswald congratulates fourth-grader Cedrick Calza on his prize-winning entry in the Navy Space Art Contest. The contest was sponsored by the United States Space Foundation last year in celebration of Naval Space Command's 15th anniversary. Over 60 students in grades 4-12 from the Dahlgren, Va., area entered the contest, which had as its theme "Steering By the Stars." Prizes for 1st and 2nd place winners in each grade and for "best in show" honors were provided by the Space Foundation. Cedrick attends Washington District Elementary School in Oak Grove, Va. Capt. Oswald visited the school as part of its annual "Space Week" program. He presented the art contest awards and spoke at two student assemblies, encouraging the students to make their education a priority.

Tracking John Glenn — 36 Years Later

By Carroll Hayden

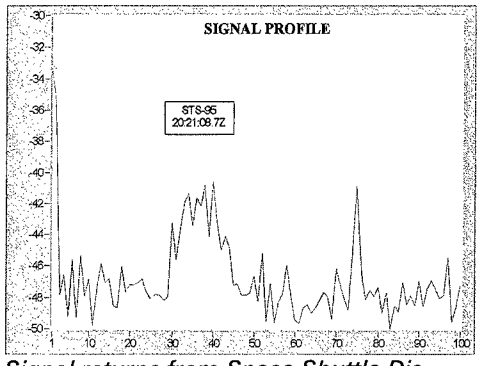


Astronaut John Glenn climbs into his Friendship 7 Mercury capsule in preparing for his first journey into space.

On Feb. 20, 1962, John Glenn became the first American to orbit the Earth in space. Aboard the spacecraft *Friendship 7*, and propelled into space by a Mercury-Atlas booster, he made three trips around the Earth before returning to land in the Atlantic Ocean.

The path of his spacecraft carried it through the Navy's network of space surveillance field stations spread across the southern U.S. from Georgia to California. *Friendship 7's* orbit had a period of 88 minutes and an inclination of 32.5 degrees. The perigee/apogee was 86 by 143 nautical miles.

At that time, the Navy's space surveillance "fence" was the only operating space sensor that was available to support NASA's tracking network for the flight of *Friendship 7*. Glenn's orbiting capsule was detected by the surveillance network, and signal strength and interferometer (baseline) phase readings from the network's San Diego, Calif., receiver station were saved on strip chart recorders.



Signal returns from Space Shuttle Discovery STS-95 detected by Naval Space Command's surveillance sensor.

When Senator Glenn flew aboard Space Shuttle *Discovery's* mission STS-95 last November, his historic return to space was again detected by Naval Space Command's modernized surveillance system.

The low inclination of *Discovery's* orbit (28.5 degrees at 340 statute miles) meant that the spacecraft would not orbit over the continental United States. Nevertheless, NAVSPACECOM was able to detect the space shuttle as it orbited over the Pacific and Atlantic Oceans. The craft was "seen" at 136 degrees west longitude by NAVSPACECOM's surveillance field station in San Diego, Calif., with illumination from the network's transmitter at Gila River, Ariz. It was also seen at 65 degrees west longitude by receiver stations in Tattnall, Ga., and Hawkinsville, Ga., with illumination from the transmitter at Jordan Lake, Ala.

The space shuttle's position near the horizon and long radar ranges resulted in a very weak signal return to NAVSPACECOM's receiver stations. However, ongoing improvements made to the nation's oldest continuously operating space surveillance system have enhanced its capabilities and enable it to fulfill a critical role in maintaining a ever-growing catalog of space objects. In 1962, when Glenn made his first space flight, there were less than 200 objects in orbit around the Earth. When he journeyed into space again aboard *Discovery* 36 years later, there were nearly 10,000 objects in the catalog.

Carroll Hayden retired with 37 years of federal civilian service in December — all with the Naval Space Surveillance Center and Naval Space Command. He served as the program manager for the Navy's space surveillance network for 11 years.

Naval Aviators Tapped for '98 Astronaut Class

Naval and Marine aviators, women and men, are part of the Astronaut Candidate Class of 1998. They have begun a one-year period of training and evaluation at the Johnson Space Center in Houston, Texas, after which they will receive technical assignments within the Astronaut Office before receiving a space flight assignment.

1998 Navy and Marine Corps astronaut candidates include:

Lt.Cmdr. Christopher J. Ferguson, Pilot; currently an F-14 desk officer with Commander Naval Air Force, Naval Air Station, Norfolk, Va.

Cmdr. Michael J. Foreman, Mission Specialist; currently an advanced orbiter cockpit project technical lead officer with Naval Air Warfare Center Aircraft Division, Naval Air Station (NAS), Patuxent River, Md.

Lt.Cmdr. Kenneth T. Ham, Pilot; currently an F/A-18 Test Pilot with Strike Aircraft Test Squadron, NAS Patuxent River, Md.

Lt. William A. Oefelein, Pilot; currently a naval aviator with Carrier Air Wing 8, NAS Oceana, Va.

Lt.Cmdr. Alan G. Poindexter, Pilot; currently a naval aviator with Fleet Tactical Support Squadron 32, NAS Oceana, Virginia Beach, Va.

Lt.Cmdr. Sunita L. Williams, Mission Specialist; currently an aircraft handling officer aboard USS *Saipan* (LHA 2).

Lt. Neil W. Woodward III, Mission Specialist; currently a project officer with Naval Strike Aircraft Test Squadron, NAS, Patuxent River, Md.

Marine Maj. George D. Zamka, Pilot; currently a project officer with Strike Aircraft Test Squadron, NAS Patuxent River, Md.

Space Training Courses Offered

Interservice Space Intelligence Operations Course (ISIOC)

The ISIOC is offered to military and civilian personnel (O-4 and below) at the SI/TK level, in all the armed services who work as space system operators. This course is also excellent for those involved in command and control warfare (C2W) activities. Remaining class dates for FY99 are as follows:

29 MAR - 09 APR	10 MAY - 21 MAY	02 AUG - 13 AUG
19 APR - 30 APR	14 JUN - 25 JUN	23 AUG - 03 SEP

Interservice Space Intelligence Operations Senior Course (ISIOSC)

A condensed version of ISIOC, the ISIOSC is offered for senior officers, O-5 and above, also at the SI/TK level. Remaining class dates for FY99 are as follows:

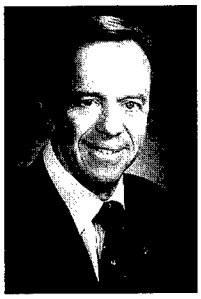
16 MAR - 19 MAR	13 JUL - 16 JUL	21 SEP - 24 SEP

Interservice Space Fundamentals Course (ISFC)

The ISFC is offered to Army, Air Force, Navy and Marine Corps officers, enlisted personnel, and civilian employees entering nonoperator staff positions who need to be knowledgeable of space operations, activities and environment. This course covers a fundamental presentation of the physical environments of space and the potential effects on manned and unmanned space systems. ISFC is offered at the Secret clearance level. Remaining class dates for FY99 are as follows:

15 MAR - 26 MAR	07 JUN - 18 JUN	16 AUG - 27 AUG
12 APR - 23 APR	19 JUL - 30 JUL	13 SEP - 24 SEP
10 MAY - 21 MAY		

All courses are conducted at the Air Education and Traing Center, Colorado Springs, Colo., unless otherwise indicated. To obtain a quota, or for further information, contact Bonnie Watson at commercial (540) 653-5151,DSN 249-5151, or email bwatson@nsc.navy.mil. The following information is needed to obtain a quota: name, rank/rate/designator, Social Security number, UIC, billet title, and phone/FAX.



In Memory Alan Shepard

Mercury and Apollo astronaut Alan B. Shepard, Jr., the first American to travel in space, died July 22 at the age of 74. Shepard first reached space on the suborbital flight of *Freedom 7* on May 5, 1961. He became the fifth human to walk on the Moon when he commanded the *Apollo* 14 mission.

Shepard was a 1944 Naval Academy graduate. During World War II he served as a young ensign on the destroyer USS *Cogswell* in the Pacific and earned his naval aviator wings three years later.

In subsequent assignments, he flew with fighter squadrons aboard aircraft carriers in the Mediterranean and western Pacific. He also attended the U.S. Navy Test Pilot School where he conducted flight test experiments and served as an instructor.

He was one of the country's first seven astronauts chosen by NASA in April 1959. Following his space flight in *Freedom 7*, he served as chief of the agency's astronaut office. He made his second and final space flight in 1971 as spacecraft commander on *Apollo* 14. He retired from NASA and the Navy in 1974 as a rear admiral.

In October 1987, Naval Space Command honored Shepard and Senator John H. Glenn, Jr. (D-Ohio) as namesakes for Naval Space Command's newly constructed headquarters in Dahlgren, Va. They were both on hand for dedication ceremonies for the new command and control center held on Oct. 1. On that occasion, Shepard discussed his experiences as an astronaut.

Reflecting on the importance of space, Shepard emphasized, "We have to maintain our space leadership in the world as we have done in the past because leadership in space means leadership in technology; and technology is what we do best."

'Learn Today to Lead Tomorrow'

YOUNG MARINES

BY JO2 KAYE TRAMMELL

It's like watching a miniature war movie. The Marines are all decked out in their freshly starched camouflage. Their boots are shined. Their faces are solemn. They can be called to attention and march all around their Virginia Beach, Va., territory.

So what's the catch?

They are mostly all under four feet tall.

Wait ... these are members of the actual Marine Corps. These are the Young Marines (or YMs). And they seem to take their job just as serious as the real thing.

"The Young Marines," explained OS2(SW) Joseph White from Fleet Surveillance Support Command, "is a group for 8 to 18-year-old boys and girls that teaches discipline, respect, military bearing and self esteem in a non-drug environment."

There is not much leeway for the tiny tikes that sign up for this service. When they say "Marine," they mean "Marine."

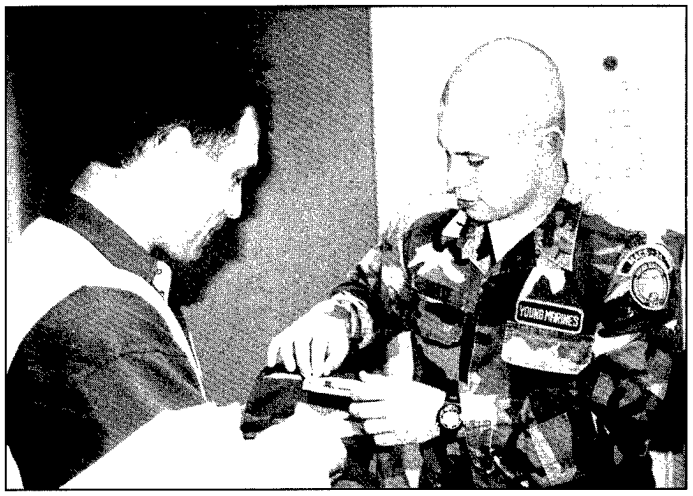
"The children have to go through a 13-week 'boot camp' before they become a YM," said White. "In boot camp, they must pass 41 hours of Saturday instruction on everything from history to physical fitness."

The key is not necessarily the information, said the Virginia Beach Marine Air Control Squadron-24 (or MACS-24) detachment's commanding officer, but in the way it's presented.

"We give children the means to have a sense of pride, sense of worth and sense of belonging," said Staff Sgt. Brian Richardson, a MACS-24 tactical data systems manager. "If the children can have confidence, then everything else follows."

After "graduation," the new YMs get the chance to wear their uniform with pride. The group meets weekly, but White explains, it is a 24-hour a day commitment.

"YMs have an obligation to obey their parents and not to do anything that would disgrace them, or the YMs," said White. "This is a part of the respect we try to instill in the children."



OS2(SW) Joseph White shows his son, Joe, how to properly put ribbons on a Young Marine uniform. This father-son team is very active with the MACS-24 Young Marine platoon.

Because the YMs fall under the Marine Corps League (or MCL), they have to adhere to strict Marine Corps policies. According to retired Marine Corps Col. Al Tase, being a YM is more than marching: it is a commitment to self discipline and honor that encompasses each aspect of the YM's life.

"We coordinate with schools to make sure each YM maintains a 'C' average," said Tase, a MCL liaison to the MACS-24 YMs.

According to White, the YMs are subject to uniform inspections and personal excellence, just as in the military. Advancements in rank are based solely on evaluations and test scores.

White is not only a parent of a YM, but the Executive Officer of the MACS 24 platoon. Filling both of these shoes is a big job, but one White wouldn't give up for the world.

"As a parent, I get the satisfaction in seeing changes in my son," said White. "As a volunteer, I get to see groups of children building self esteem and drastically positive changes in their personal selves."

White isn't the only one who feels good about working with the YMs.

"Just watching the youngsters grow and change into better educated leaders is enough," said Tase.

"I've always worked with young people," began retired Marine Corps Chaplain Frank Triscritti. "I want to make sure today's children have the proper moral fiber."

White can honestly admit that the most drastic turn around he has seen in a YM has been his own little YM.

"When my son moved here from Baltimore," began White, "he was a mess. He was constantly in trouble with the police, in school and had bad grades. Since he's been active in the Virginia Beach YM detachment, his behavior and his grades are both up!"

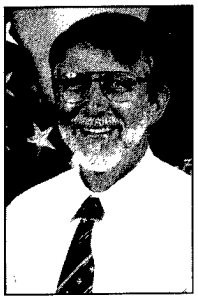
According to Triscritti, the YMs is an all around good deal for any child.

"We have kids from broken homes and abused lives," said Triscritti. "We teach brotherhood. Whether you are green or yellow, in the YMs, you are the same."

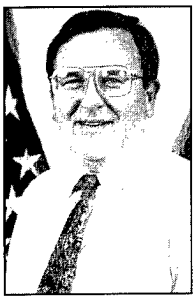
According to Triscritti, the YM motto sums it up: "Learn today to lead tomorrow."

JO2 Kaye Trammell is the public affairs officer for Fleet Surveillance Support Command in Chesapeake, Va.


Pieter Traas


Dr. John Springer

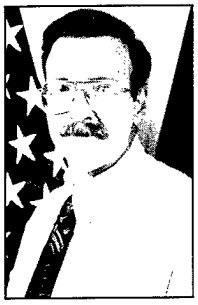

Carmond Robbins


Carroll Hayden


Joyce Davis


Gail Workman

Naval Space Command Civilian Personnel Decorated


Harold Meyers


John Trammell


Dr. P. Schumacher


Patricia Langley

Twenty-two members of Naval Space Command recently received some of the highest honorary awards presented by the Navy to civilian employees. The awards recognized long-term exceptional performance across several areas of expertise.

Earning the Superior Civilian Service Award were Pieter Traas, Dr. John Springer, Carmond Robbins, Carroll Hayden, Joyce Davis, Gail Workman, Harold Meyers, John Trammell, Dr. Paul Schumacher, Jr., and Patricia S. Langley

Earning the Meritorious Civilian Service Award were Philip LaTulippe, Diane Leite, Samuel Estill, Diane Jacobs, Anita Norris, Kenneth St. Clair, Deborah Perini, James Rose, Jr., Michael Carr, Wendolyn Brown, Edna Jenkins, and Terri Smith.

Pieter Traas has served as NAVSPACECOM's technical director for seven years. He has primary responsibility for the development and implementation of the command's strategic plan. He has revitalized research and development programs within the command to ensure they are consistent with the command's vision, and he has coordinated an effort with U.S. Space Command, NASA, and other agencies to gain support for improving space surveillance capabilities.

Dr. John Springer, a member of the command's Space Plans Division for 12 years, is one of the Navy's leading experts on the Space-Based Infrared System (SBIRS) and the operational missions it supports. He has been an advocate for improved ballistic missile detection systems and tactical support.

Carmond Robbins, as director of the Management Support Division, has effectively supervised NAVSPACECOM's fiscal planning, budgetary concerns, and personnel and manpower management through a period of declining resources. Under her guidance, the division continues to seek new ways of improving customer service in financial, administrative, and personnel support.

Carroll Hayden served as program manager for the command's space surveillance system until his retirement in December. In that role for 11 years, he led several major upgrades to improve the performance of the system. Furthermore, he charted a clear path to future modernization of the sensor.

Joyce Davis has served 14 years with NAVSPACECOM's Management Support Division. As head of the Resource Branch since May 1995, she has been particularly effective in managing the command's financial performance and executing programming, planning, and budgeting (PPBS) processes to ensure the command is positioned to meet mission requirements.

Gail Workman, as head of the command's Space Policy and Requirements Branch, has been a principal contributor to the development of naval space policy, strategy, and doctrine. Her efforts enabled the Navy to retain important tactical and acquisition capabilities and have influenced the tactical employment of national intelligence systems to benefit operational forces.

Harold Meyers was recognized for his work over the past two years as the command's strategic planner. He has been directly responsible for gaining consensus on a new strategic plan, and he has been a leader in the resulting reorganization of the command's Naval Space Operations Center and the establishment of a command requirements process.

John Trammell, as head of the Satellite Communications Branch for four years, has made myriad conributions to naval satellite communications through innovative efforts in EHF communications, the new Global Broadcast Service, fleet education, and basic space policy issues in support of the tactical warfighter.

Dr. Paul Schumacher, Jr., has come to be recognized as an international expert in the field of space surveillance in recent years. He has been an effective advocate for advances in the space catalog, parallel processing, and all aspects of monitoring space debris.


Philip LaTulippe


Diane Leite


Samuel Estill


Diane Jacobs


Anita Norris


Kenneth St. Clair

for Superior and Meritorious Service

Patricia Langley has served with the Naval Space Surveillance Center and Naval Space Command for 13 years. Most recently as head of the Manpower, Administration, and Training Branch, she was instrumental in the successful consolidation of NAVSPACECOM with the Naval Space Surveillance Center, and she has been effective in improving administrative and personnel support programs.

Philip LaTulippe's award recognized his work as deputy director of NAVSPACECOM's Operations Division over the past two years. Under his management, the command sustained an operational tempo during several exercises and real-world operations that enhanced the command's stature as a leader in space for the Department of Defense.

Diane Leite, serving as head of the Analysis and Software Branch for five years, has managed efforts to support software maintenance of the command's existing mission system, as well as all software engineering and development to meet emerging requirements for new or improved functionality.

Samuel Estill was recognized for his work since 1993 as head of the engineering support section in the command's Space Surveillance System Program Office. During that time, he has executed technical oversight of the system, conducted system performance testing, administered logistics funding for nine field stations, and provided oversight of operational implementation of sensor improvement projects.

Diane Jacobs, as configuration manager for information systems at NAVSPACECOM since 1993, has been responsible for control of all information technology hardware, software, and telecommunications resources. Additionally, she has served as the liaison between the command and the Integrated Tactical Warning and Attack Assessment (ITW/AA) community. Most recently, she has overseen all efforts at NAVSPACECOM to ensure command systems are Year 2000 compliant.

Anita Norris was recognized for her service as head of the Plans and Resources Branch since 1993. She is responsible for developing and coordinating plans and objectives to ensure proper support for the command's information and computer systems. This includes Year 2000 plans and reporting, command information systems configuration management, development of a command business plan, and budget development and execution.

Kenneth St. Clair has managed the command's mission computer system as head of the Operations and Maintenance Branch since 1993. His direct involvement and oversight have contributed to an outstanding system availability that exceeds 99 percent.

Deborah Perini's technical expertise and tireless efforts as head of the special projects section for the Analysis and Software Branch since 1993 were critical to the command's successful transition to a new mission system architecture. She has also been instrumental in the Y2K renovation of 1.6 million lines of code while continuing to maintain full operational support.

James Rose provides management and technical oversight of naval space surveillance system operations as head of the space surveillance section of NAVSPACECOM's Space Control Branch. In


Deborah Perini


James Rose, Jr.


Michael Carr


Wendolyn Brown


Edna Jenkins


Terri Smith

that position since 1997, his technical expertise and leadership have been critical to the command's processing and analysis of surveillance information, and the successful completion of testing and integration of major software deliveries.

Michael Carr has headed the Hardware Engineering and Integration Branch since 1993. His skills in system integration were instrumental in helping the

*(Please see **Civilians** on page 18)*

Civilians

(Continued from page 17)

command implement GCCS, coordinate the development of EHF satellite communications terminal operations, and establish secure electronic mail connectivity.

Wendolyn Brown heads the Alternate Space Control Center analyst operations group. She has supervised ASCC analysts in the command's Space Control Branch, directed operations for satellite vulnerability and ASCC information, validated and integrated mission system programs, and managed special projects to significantly improve support for the fleet and U.S. Space Command.

Edna Jenkins, who has headed the command's Data Analysis and Support Section since 1990, is universally recognized as an expert in the field of operational orbital mechanics and the cataloging of space objects. Her leadership skills have been critical in supporting the command's expanding role in space control missions.

Terri Smith is an acknowledged expert on the distribution of ephemeris data and electronic interfaces with NAVSPACECOM's extensive customer base. Leading the command's Fleet Data Support office since 1989, she successfully revalidated all customer interfaces to ensure accurate and timely product delivery during the command's transition to a new mission system.

RM1 Johnson

CTA2 Callis

Diane Anderson

Tammy Hudson

People of the Quarter

Civilian and military personnel at Naval Space Command were recently selected for quarterly awards for July through September 1998.

Petty Officer 1st Class Henry E. Johnson is Sailor of the Quarter. His award recognizes his work as the technical control leading petty officer in the Joint Information Processing Center at Naval Space Command. Responsible for over 120 vital communications links for the command, he was responsible for training on communications systems for five watch sections in JIPC and has served as the focal point for the command's unclassified video teleconferencing system. Johnson, a radioman, has also served as the assistant physical readiness testing coordinator for Naval Space Command and as president of the Dahlgren Senior Petty Officers' Association.

Petty Officer 2nd Class Tina M. Callis is Junior Sailor of the Quarter. A cryptologic technician, she was cited for her service as the administrative assistant for the Tactical Exploitation of National Capabilities (TENCAP) Branch at NAVSPACECOM. She is responsible for coordinating numerous temporary additional duty orders and manages budgets for diverse projects that account for equipment located around the world. She has volunteered for a wide variety of additional tasks, qualifying as a member of the Auxiliary Security Force and serving as a command physical fitness training assistant and Recreation Committee member.

Diane M. Anderson is Civilian of the Quarter. As a computer specialist in the Plans and Resources Branch of the Information Systems Division, she has coordinated software changes made to Naval Space Command's mission processing system. During this period, she developed a software "working directory" for programmers and analysts that will significantly enhance their ability to access the latest version of the mission system software. In addition, she serves as the command's Federally Employed Women coordinator.

Tammy L. Hudson is ADP Watchstander of the Quarter. She was cited for her response to a malfunction with the command's primary Universal Protocol Translator (UPT). She promptly initiated a switch to the backup UPT, which restored all communications capabilities and maximized system availability.

Civilian Length of Service Awards

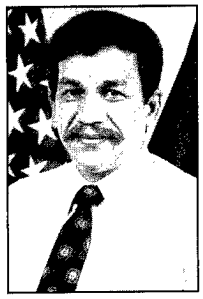
30 Years

Pieter Traas

25 Years

Joyce B. Davis

Thomas Sanford



Herb Reynolds

Awards & Recognition

Legions of Merit

Capt. Daniel E. Erndle as director of Naval Space Command's Intelligence/ Operations Division from September 1996 to August 1998.

Cmdr. Austin W. Boyd as director of NAVSPACECOM's Space Plans Division and Space Policy Branch from January 1995 through August 1998.

Defense Meritorious Service Medals

Cmdr. John A. Sullivan as military satellite communications systems officer for U.S. Space Command at Peterson AFB, Colo., from June 1995 to June 1998.

Lt.Cmdr. Errol F. Becker as senior staff officer for the plans and policy staff of the National Security Agency from March 1994 to October 1997.

Meritorious Service Medals

Cmdr. Gerald N. Smith as head of the Operations Directorate for the Naval Satellite Operations Center from March 1996 to March 1998.

Lt.Cmdr. Mark O. Rodgers as head of Naval Space Command's Space Support Team Branch from July 1995 to September 1998.

Navy & Marine Corps Commendation Medals

Cmdr. Robert R. Taylor as project manager for NAVSPACECOM's Information Systems Division and head of the Support Branch in the Operations Division from November 1997 to September 1998.

Lt. Marie T. Gordon as administrative officer for Training Squadron Three from May 1995 to May 1998.

Lt. Steven Jacobs as UHF spacecraft operations officer for NAVSPACECOM from November 1996 to October 1998.

Lt. Larry D. Watkins as a member of NAVSPACECOM's Space Support Team and Operations Center watch officer from November 1996 to November 1998.

ISCS(AW) Fredric D. Hyde II as Intelligence Branch leading chief petty officer at Naval Space Command from September 1995 to July 1998.

OSC(SW) Thomas E. Savoy as operations logistics chief petty officer for Commander, Fleet Activities, Sasebo, Japan from September 1995 to May 1997.

EAC(SCW) Virgilio G. Peredo as engineering chief for Naval Space Command's Facilities Branch from January 1997 to November 1998.

Joint Service Achievement Medal

Lt. Larry D. Watkins as space liaison officer for U.S. Space Command to Joint Task Force-Southwest Asia in Riyadh, Kingdom of Saudi Arabia, during Operation Southern Watch from August to December 1997.

Navy & Marine Corps Achievement Medals

Lt. Patrick C. Corcoran as flight schedules officer, line division officer, and electronic warfare tactics officer in Fleet Air Reconnaissance Squadron Six from August 1995 to October 1998.

IS2 Walter J. Lloyd, Jr. as an imagery analyst aboard USS Theodore Roosevelt (CVN 71) from July 1996 to August 1997.

Military Outstanding Volunteer Service Medal

ISCS(AW) Fredric D. Hyde II for public service to the communities of the Naval Surface Warfare Center, Dahlgren Division, and King George, Va., from September 1995 through July 1998.

NATO Medal

ET1 Clayton E. Frayser

Good Conduct Awards

RM1(SW) Yolanda Rivera (4th)
RM2 Walter J. Swieder III (2nd)
OS2 Tarris C. Randolph (1st)

Navy Sharpshooter Pistol Ribbon

EW2 Bob E. Baker

Navy Expert Pistol Medals

Lt.Cmdr. Mark A. Sanford
Maj. Mike McDonald
Lt.j.g. Gerald P. Oliver
Capt. Andrew Straley

Auxiliary Security Force Academy

CTO3 Michael Heissenbuttle
CTA2 Tina M. Callis
YN2(AW) Joseph D. Parent
ET3 Brian Malone
OS3 Calvin L. Revelle, Jr.
OSC(SW) David R. Litten

Outstanding PRT Scores

IS3 Gary F. Barile
Lt. David A. Bermingham
OS2 William J. Bradshaw
Lt. Danny K. Busch
CTACS Denise M. Collins
CTASA Richard M. Corpening
Lt.Cmdr. Bruce R. DeMello
Lt. Bruce A. Dickey
Lt.Cmdr. Coley L. Evans
Lt.Cmdr. Michael Finnegan
RM1 Henry E. Johnson
Capt. Robert B. Jones
IS2 Walter J. Lloyd
Lt. Roger J. Lucas
Lt. Stacy R. Murch
RM1 Marie M. Norman
Lt.j.g. Gerald P. Oliver
Lt.Cmdr. Lawrence A. Pemberton
EAC Virgilio G. Peredo
Lt. John C. Prohaska
OS2 Tarris C. Randolph
Cmdr. Gerald N. Smith
IS1 Diane L. Tucker
Lt. Oscar Tequida
Lt.Cmdr. Catherine J. Varela
Rear Adm. Thomas E. Zelibor

Special Achievement Awards

Marilyn S. Overton
Sandra A. Bone

Letters of Commendation

OS2 Yvonne S. Ferrell
Robert B. Graham
Martha L. McElhinney
IS2 John J. Fritz
OS3 Jeri D. Bloch

CALENDAR

Meetings & Symposia

West '99, Jan. 19-21, San Diego, Calif. Sponsored by AFCEA and U.S. Naval Institute. Call (703) 631-6125.

Virtual Government '99, Feb. 23-25, Washington, D.C. Sponsored by AFCEA International. Call (703) 631-6238.

Southeast C4I Conference & Exposition, March 2-4, Tampa, Fla. Sponsored by AFCEA Tampa-St. Petersburg Chapter. Call J. Spargo & Associates, Inc., (703) 631-6200.

Sea-Air-Space Systems & Technology Exposition, March 30-April 1, Washington, D.C. Sponsored by the Navy League. Call (703) 528-1775.

Global Air & Space Business Forum & Exposition, May 3-5, Arlington, Va. Sponsored by the American Institute of Aeronautics and Astronautics. Call (703) 264-7500.

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- Mobile Communication Satellites, Feb. 4-5, Arlington, Va.
- Spacecraft Systems Design & Engineering, Feb. 8-11, Beltsville, Md.
- Fundamentals of Orbital & Launch Mechanics, Feb. 17-19, Albuquerque, N.M.
- Small Satellite Design & Technology, Feb. 22-24, Albuquerque.
- SATCOM Systems Engineering, March 22-24, Los Angeles, Calif.
- Ground Station Design, March 25-26, Los Angeles, Calif.

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- Military Satellite Communications, Jan. 19-22, San Diego, Calif. (Classified).
- The U.S. Intelligence Community: Who Does What, With What, For What, Jan. 20-21, San Diego, Calif. (Classified).
- C4ISR Architecture Framework Implementation, Jan. 19-22, San Diego, Calif.

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